

Clinical Findings in Pediatric Respiratory Disorders

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This is a concise description of the clinical manifestations frequently seen in the more common respiratory disorders affecting pediatric patients. After a brief description of each disease, the clinical findings associated with the disorder are summarized in table format. Students are cautioned that the tables represent a summary of the “classic” findings in moderately advanced cases. In reality the occurrence and degree of the typical findings vary with the severity of the disease and the patients overall health status. The tables are intended to serve as a reference and to help the student mentally organize the clinical manifestations of the more common respiratory disorders in logical format.

Laryngotracheobronchitis

Laryngotracheobronchitis {LTB}, also referred to as croup, is a viral respiratory infection primarily involving the upper airway(s) and producing characteristics clinical findings. The subglottic edema that develops produces a partial laryngeal obstruction, which has most effect in the area of the cricothyroid ring. Since this is the narrowest portion of the child’s airway, any swelling that develops produces a substantial increase in resistance to ventilation.

The most common causal organisms of the LTB are parainfluenza virus, respiratory syncytial virus, and adenovirus. The typical clinical findings for laryngotracheobronchitis are as follows.

Patient identification	Occurs in children usually less than 3 years of age
Chief complaint	Dyspnea; barking cough; inspiratory stridor
History of present illness	Gradual onset of problem commonly after a “cold”; symptoms may be worse at night; onset usually in fall and winter months
Past history	Noncontributory
Family history	Noncontributory
Vital signs	Tachypnea; tachycardia; low-grade fever
Inspection mild distress	Child does not appear to be acutely ill; may appear anxious in
Palpation	Normal
Percussion	Normal

Auscultation	Normal lung sounds; may hear inspiratory stridor in neck region
Chest radiograph	Shows bottleneck narrowing of trachea below larynx
Blood gas levels	Usually show mild respiratory alkalosis and hypoxemia; may progress to respiratory acidosis and moderate hypoxemia in more severe cases
Clinical laboratory findings	Nonspecific
Pulmonary function	Not applicable
ECG	Nonspecific

Epiglottitis

Epiglottitis, an inflammation of the epiglottis, is a bacterial infection that primarily affects pediatric patients, but may also affect adults. The swelling of the supraglottic structures causes a substantial upper airway obstruction to ventilation and may produce sudden and complete obstruction. It has been suggested that the term *supraglottitis* is more applicable, since the condition also causes inflammation of the arytenoids and aryepiglottic folds.

Epiglottitis is most commonly caused by *Haemophilus influenza* type B, but may also be caused by *Streptococcus* and *Staphylococcus* organisms. Although it occurs less frequently than LTB, Epiglottitis potentially represents a more serious problem in terms of airway patency and maintenance. Following is a list of the typical clinical findings associated with Epiglottitis.

Patient identification	Occurs most often in children approximately 3 to 6 years of age
Chief complaint throat; dysphagia	Marked Dyspnea and inspiratory stridor; muffled voice; sore
History of present illness	Sudden onset with rapid worsening; after a “cold”; onset usually in fall and winter months; lack of appetite
Past history	Noncontributory
Family history	Noncontributory
Vital signs	Tachypnea; tachycardia; high fever

Inspection	Characteristic sitting position leaning forward with head and neck extended and drooling; cyanosis occurs in more severe cases; intercostal retractions; visualization reveals large cherry red epiglottis. Visualization or disturbance of the epiglottis may easily precipitate a complete airway obstruction. It should be performed only when necessary, and the appropriate equipment and personnel to place an artificial airway should be immediately available at the bedside.
Palpation	Normal
Percussion	Normal
Auscultation	Normal lung sounds; may hear inspiratory stridorous sound may be transmitted from epiglottic area; lung sounds may be significantly decreased
Chest radiograph	Usually normal; may show enlarged epiglottis (lateral neck x-ray film positive for epiglottic swelling three to four times normal)
Blood gas levels	Usually show hypoxemia; respiratory acidosis in more severe cases
Clinical laboratory findings	Blood cultures frequently positive for Haemophilus; leukocytosis with left shift; throat cultures usually not done
Pulmonary function	Not applicable
ECG	Nonspecific

Cystic Fibrosis

Cystic fibrosis (CF) is an inherited disease that affects the exocrine glands. It is also referred to as mucoviscidosis and fibrocystic disease of the pancreas. The primary areas of the body that are affected include the lungs, gastrointestinal tract, and sweat glands. Cystic fibrosis is characterized by thick mucous secretions that impair pulmonary hygiene. The resulting sputum retention promotes infections, atelectasis, airway obstruction, and bronchiectasis. Over a period of years, pulmonary fibrosis, hemoptysis, pneumothorax, and cor pulmonale may occur in more severe cases. The clinical findings associated with CF are as follows.

Patient identification	Occurs equally in males and females; predominately in Caucasians; usually diagnosed in childhood
Chief complaint advanced stages	Dyspnea; productive cough; hemoptysis usually occurs in

History of present illness fever	Change in color; consistency or volume of sputum production;
Past history	Chronic lung infections; chronic diarrhea. Meconium ileus
Family history	May be positive for cystic fibrosis
Vital signs	Tachypnea; tachycardia; high fever
Inspection	May be normal; increased anteroposterior diameter will occur in advanced stages; digital clubbing; increased JVD; cyanosis; malnourished appearance
Palpation	May be normal; decreased chest expansion
Percussion	May be normal, decreased resonance with consolidation or atelectasis occurring in advanced stages
Auscultation	Inspiratory and expiratory crackles and wheezes
Chest radiograph consolidation	May be normal; hyperexpansion; fibrosis in more advanced stages;
Blood gas levels acidosis	Mild hypoxemia; progresses to severe hypoxemia and respiratory
Clinical laboratory findings	Increase in sweat chloride greater than 60mEq/L; sputum cultures often positive for <i>Staphylococcus aureus</i> or <i>Pseudomonas aeruginosa</i>
Pulmonary function	Obstructive defect early; restrictive defect late
ECG block	Nonspecific; may show sinus tachycardia, right bundle branch

Respiratory Distress Syndrome

Respiratory distress syndrome (RDS) of the neonate has had many synonyms, among them hyaline membrane disease, infant respiratory distress syndrome (IRDS), surfactant deficiency syndrome, and pulmonary hypoperfusion syndrome. RDS is primarily caused by either a deficiency in or an abnormality of pulmonary surfactant. This, in turn, may cause a closed loop amplification system of atelectasis, reduced pulmonary compliance, depressed alveolar ventilation, hypoxemia, pulmonary vasoconstriction, decreased pulmonary metabolism, and further reduction in surfactant production. Some factors that predispose an infant to RDS include premature birth, maternal diabetes, prenatal asphyxia, and prolonged labor. The resultant reduction in lung compliance causes an increased work of breathing and the following clinical findings.

Patient identification	Primarily occurs in infants of less than 34 weeks gestational age
Chief complaint	Respiratory distress
History of present illness	Rapid onset of respiratory distress within 6 hours of birth
Past history	Noncontributory
Family history	Uncontrolled maternal diabetes
Vital signs	Tachypnea; tachycardia
Inspection	Nasal flaring
Palpation	Noncontributory
Percussion	Noncontributory
Auscultation grunting	Diminished air entry; fine inspiratory crackles; expiratory
Chest radiograph	Diffuse haziness (ground glass) air bronchogram; cardiomegaly
Blood gas levels severe cases	Hypoxemia; may progress to severe respiratory acidosis in more
Clinical laboratory findings	Noncontributory
Pulmonary function	Reduced compliance
ECG	Nonspecific

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